IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF NORTH CAROLINA

GLOBAL PLASMA SOLUTIONS, INC., *Plaintiff*, v. ELSEVIER INC. and ELSEVIER LTD., *Defendants*.	Case No. 3:22-cv-00034-RJC-DCK JURY TRIAL DEMANDED

FIRST AMENDED COMPLAINT

Plaintiff Global Plasma Solutions, Inc. ("GPS"), by and through its undersigned attorneys, brings this First Amended Complaint against Defendants Elsevier Inc. and Elsevier Ltd. (collectively, "Elsevier" or "Defendants") and alleges as follows:

INTRODUCTION

1. This case involves the world's largest scientific publisher, Elsevier Ltd. and Elsevier Inc. ("Elsevier" or "Defendants") directly, intentionally, and repeatedly targeting the Charlotte, North Carolina company Global Plasma Solutions, Inc. (now known as "GPS Air" or "GPS"), by publishing a study that falsely concluded that GPS's air cleaning technology is ineffective and produces harmful compounds. In 2021, Elsevier knowingly published this false and fabricated study about GPS's technology and expressly named GPS and its location in the published article. GPS sent Elsevier multiple communications detailing the misconduct and asking for a retraction to avoid litigation. Elsevier ignored GPS's communications, forcing GPS to file the instant lawsuit. Elsevier's misconduct has been devastating to GPS's business, causing massive harm to the company and its hard-working employees located in Charlotte, North Carolina, many of whom have lost their jobs as a result of Elsevier publishing the false study. GPS has suffered losses exceeding $1.8 billion.

2. The false study was conducted by pseudo-neutral academics with a vendetta against GPS and with the intent to spread false and misleading statements about GPS's proprietary technology under the guise of an unbiased and peer-reviewed journal. The purpose of the study was to advance the false narrative that GPS's needlepoint bipolar ionization technology (NPBI™) was unsafe and ineffective in order to seek publicity and provide an advantage to one of GPS's primary competitors. Elsevier, through its peer review and editorial processes, knew or purposefully avoided the fact that the main conclusion of the study was false and based on several material errors and inconsistencies. It published the study as part of its "profits over ethics" agenda.

3. After GPS demanded a retraction and filed this lawsuit, Elsevier amazingly published a second study focused on the same GPS product in 2022 (and again expressly naming GPS and its location) where the underlying data proved that the initial study was false and fabricated. Despite this fact, Elsevier and the authors misrepresented that the second study was "largely consistent" with the first study, further damaging GPS's business. Elsevier also buried the second study by creating a paywall and making it harder for readers to access. By the time Elsevier published the second study, the damage to GPS had become irreparable.

4. The result was an intentionally false and reckless study that fabricated results, violated every scientific principle and defamed and disparaged a technology that is effective at helping to reduce the airborne virus that causes COVID-19 in indoor environments. The senior publisher at Elsevier who was responsible for the journal that published the false initial study in 2021 testified in this case that Elsevier bears responsibility for any false statements in the articles and studies it publishes, which includes the false statements in the study at issue here.

5. The main author of the initial study, Brent Stephens, a professor at the Illinois Institute of Technology ("IIT"), assembled a team consisting of individuals who were all too eager to disparage GPS (including Elliot Gall ("Gall") and Delphine Farmer) and individuals whom he could easily manipulate (including his graduate-student advisees Yicheng Zeng ("Zeng") and Prashik Manwatkar) to pen a study with the predetermined outcome that GPS's technology was ineffective and harmful. After sham peer-review and editorial processes, Elsevier ultimately published that study, entitled "Evaluating a commercially available in-duct bipolar ionization device for pollutant removal and potential byproduct formation" (the "First Study") online in March 2021 and in print in May 2021 in its scientific and allegedly peer-reviewed journal *Building and Environment.*[1]

6. The lead author of the First Study, Zeng, has already admitted under oath in a deposition taken in another lawsuit that the underlying data reported in the First Study was false and contradicted the published results. Specifically, the data reported in the appendices to the study were the exact opposite of the results in the text of the published study. Moreover, the authors and Defendants ignored and suppressed data that contradicted the conclusions reached by the First Study.

7. Rather than adhering to the scientific method, in which a researcher poses a question, forms a hypothesis, and then tests that hypothesis to arrive at a well-founded, independent conclusion, Stephens and his team started with the desired conclusion and worked backwards, suppressing, and distorting any evidence that failed to fit their predetermined narrative. Indeed, on September 13, 2020—before Stephens conducted a single experiment on GPS's technology—Stephens described GPS's NPBI™ technology as "whatever bullshit they sell."

[1] A true and correct copy of the First Study is attached hereto as **Exhibit A.**

Stephens was determined to tell, under the shield of academia, the false story that GPS's technology caused an increase in certain harmful byproducts, including acetone, ethanol, toluene, and acetaldehyde. Elsevier knew of Stephens' misconduct or purposely avoided it.

8. Stephens, Gall, and Zeng ignored and suppressed contradictory results which showed GPS's technology was safe and effective. The peer review and editorial processes put Elsevier on notice of this suppressed and contradictory data.

9. In an email dated November 2, 2020, during the thick of conducting the experiment that is the subject of the First Study, Zeng reported test results to Stephens which showed agglomeration efficacy—data proving that GPS's NPBI™ technology worked. Not happy with this conclusion, Stephens responded trying to come up with any reason to ignore the results and later tried to justify his faulty logic. In other emails, Stephens acknowledged there was test data which produced different results, but he ignored and suppressed these tests. After swaying Zeng to suppress data that supported the efficacy of GPS's technology and selectively including only those figures that purported to show that GPS's technology was ineffective and produced harmful byproducts, Stephens proclaimed "*I think our story is strong now*." It was a story that had already been written regardless of the actual data. Through the peer review and editorial processes, Defendants were aware of this misconduct when the First Study was published.

10. In emails obtained by GPS, Stephens, in consultation with lawyers at IIT, debated whether to name GPS and its product in the First Study. The authors ultimately left the decision to Elsevier who chose to name GPS specifically and went even further to name the exact location of the company in "Charlotte, North Carolina, USA." The inevitable result was to harm GPS and the honest GPS employees who worked at the company's headquarters in Charlotte, North Carolina. Elsevier's sole objective was to increase the profile and profits of its journal.

11. While conducting the study in late 2020 but prior to publication, Stephens made a "cold call" to a reporter at the New York Times seeking to gain publicity for the First Study. Prior to the First Study, there had been no media attention around GPS or any suggestion that GPS's technology created harmful byproducts. Stephens responded with excitement when the reporter agreed to do the story well before the results of the study were even completed. Stephens already knew how he would construct the "story" even before finishing the First Study. Stephens was chasing fame and grant money from GPS's competitors who were quick to fuel the predetermined experiment. Defendants knowingly published the First Study which specifically attacked GPS with a flawed study that yielded false results.

12. As the publisher, Elsevier knowingly, or with reckless disregard, published the First Study that falsely attacked GPS's technology and that specifically identified GPS and its location, inevitably causing harm to GPS in North Carolina.

13. Stephens and the other authors knew the study, if published by Elsevier, would cause massive damages to GPS and its business. In emails between the authors in December 2020 shortly before they submitted the study to Elsevier, they expressly debated whether to specifically name GPS in the First Study. Stephens stated, "If it got a lot of press and seriously damaged profits, they could spend $$$ and force to retract the paper or say something that qualifies it or what have you." In another email, Stephens explained, "it seemed to be a lawyer driven concern of connecting dots from naming a company to causing damages (assuming people read this and stop buying their products which may be a stretch) to company seeking compensation via suit."

14. Stephens and the authors were not concerned about whether the results of the First Study were valid and accurate, but whether they could survive a lawsuit. Stephens opined that their "highest risk would be if there is a fundamental flaw in the results or data." The entire focus

was building a technical legal argument to defend the flawed study. These so-called scientists were less concerned about verifying their conclusions and more focused on talking to lawyers to develop defenses when a lawsuit was filed. Elsevier, as a sophisticated scientific publisher, likewise knew that the First Study would cause harm to GPS in North Carolina and expose it to litigation.

15. In the emails, the authors further noted that they could test other manufacturers' technologies but expressly decided not to do so and focused solely on GPS to attack its technology only. Defendants knew the First Study was directed at GPS in Charlotte, North Carolina and knew the purpose was to show GPS's technology was harmful. There was no independent scientific justification for naming GPS and its location in the First Study.

16. After publishing the defamatory First Study, Elsevier retained all the rights to the content of the First Study. Elsevier also had the contractual right to reject the First Study if it contained defamatory material or anything that could be harmful to a third party. Elsevier willfully or recklessly ignored the overwhelming evidence of the false conclusions made in the First Study knowing it would harm GPS and its employees in Charlotte, North Carolina.

17. The resulting First Study and its data were fundamentally flawed, false and biased in several ways. The First Study's conclusion that GPS's technology caused an increase in certain harmful byproducts was false. Most significantly, the authors intentionally hid a contrary test result (acetaldehyde) knowing it disproved the study's main conclusion. Additionally, it is elementary that a single experiment cannot support a conclusion as to causation, as mere association does not equal causation. But more importantly, the critical data that Elsevier published in the appendices contradicted the data that Elsevier published in the main body of the First Study on which it relied to conclude GPS's device caused an increase in certain volatile organic compounds ("VOCs").

Zeng, the lead author of the First Study, admitted that the measurements reported in the First Study that led to these conclusions ***were actually incorrect when compared with two appendices contained in the First Study's supplementary data***, thus disproving the First Study's principal conclusion. In addition, beyond this material error, the authors cherry-picked results from two different tests for many of the compounds to further serve their "story" and ignored contradictory results.

18. The peer review and editorial processes alerted Elsevier to each of these issues before it published the First Study to the public. The First Study's flawed design was readily apparent to Elsevier on the face of the First Study. The authors' suppression and misrepresentation of data likewise was readily apparent and known to Elsevier, since it published supplementary data containing the results of two different tests for only certain compounds (suppression) and that contradicted the data reflected in the main body of the First Study (misrepresentation). And yet, despite purporting to subject the First Study to peer-review and editorial processes wherein the First Study and its supplementary data were submitted to others in academia for review of its contents[2]—and despite that Elsevier retains the right to refuse publication of, or require changes to, any article of a libelous nature or that may cause damage or harm to others—Elsevier published the First Study notwithstanding the blatant violations of scientific integrity, distortions of data, and false conclusions.

19. The First Study was further weaponized by competitors of GPS who teamed up with Stephens, including GPS's competitors enVerid Systems, Inc. ("enVerid") and Marwa Zaatari ("Zaatari") (who worked for enVerid), to help create what they termed "bipolar backlash" in undermining GPS's technology to steal GPS's customers. Zaatari relied on the First Study in

[2] Elsevier, *What is Peer Review*, https://www.elsevier.com/reviewers/what-is-peer-review.

making false and defamatory statements about the efficacy and safety of GPS's products, including using the First Study in an "Open Letter" dated April 12, 2021—a mere month after the First Study was published online and before it was published in print—to parents and school boards attacking GPS's technology and seeking to steal those customers from GPS. Zaatari, working for GPS's competitor, was working with her close friend Brent Stephens well before the First Study was published as evidenced by internal enVerid emails.

20. Elsevier published the false First Study, cloaking it with scientific credibility. Elsevier advertises its strict editorial review policy for publishing, rejecting, or retracting articles in its journals. Despite this, Elsevier knowingly published the flawed and fabricated First Study attacking GPS directly, specifically naming GPS and its location in Charlotte, North Carolina. In fact, Elsevier accepted $4,080 from the authors to publish the First Study on its open access program—meaning the First Study was free to the public such that the First Study could be as widely disseminated as possible.

21. As predicted by the authors themselves, the First Study inflicted irreparable harm on GPS and its hardworking employees. The intended audience for *Building and Environment* includes individuals and companies who make critical decisions about what air-cleaning technologies should be incorporated into the indoor built environment, GPS's main customer base. The First Study was featured in numerous national media outlets including but not limited to *Fast Company*, *Wired*, *Mother Jones*, *KFF Health News*, *NBC*, and *Axios*, resulting in massive damages to GPS, including substantial loss of value.

22. Elsevier's purported peer-review and editorial processes were a sham, as they failed to correct obvious flaws—*in equipment, procedure, and reporting*. After Elsevier published the First Study, GPS notified Elsevier of the invalidity, unreliability, and falsity of the First Study and

the misconduct of its authors in a letter dated January 11, 2022 and requested that Elsevier retract the First Study in full to mitigate GPS's damages.[3] GPS's letter provided evidentiary support for its allegations, including through emails exchanged between the authors that set out their misconduct and biases against GPS. GPS's letter to Elsevier specifically advised Elsevier that the conclusions reached in the First Study were false, misleading, and defamatory, and that the letter "shall serve as five (5) days written notice of the false and defamatory statements contained in the [First Study]" under N.C. Gen. Stat. § 99-1.

23. Despite being advised of these clear errors by GPS, Elsevier refused to take corrective action or even provide GPS a timeline for resolution of the issues. Although on January 12, 2022, Elsevier responded that it would "*look into this matter – which, in accordance with [Elsevier's] policies and industry guidelines on publishing ethics, will include reviewing [GPS]'s allegations with the authors of the paper as well as the editor of the journal*," it has taken no steps to rectify the situation, to correct any of the flagrant inaccuracies, or to provide readers with additional context regarding the authors' clear biases against GPS.

24. On January 20, 2022, GPS followed up with Elsevier, further emphasizing the importance that Elsevier resolve this matter immediately to mitigate the tremendous harm GPS has suffered and continues to suffer as a result of the publication of the First Study. Elsevier again ignored GPS.

25. After GPS sent its retraction demands—and after this lawsuit was filed—Elsevier published yet another study conducted by Stephens and Zeng testing the same GPS device entitled "Evaluation of an in-duct bipolar ionization device on particulate matter and gas-phase constituents in a large test chamber" (the "Second Study") online in February 2022 and in print in

[3] A true and correct copy of the January 11, 2022 letter is attached hereto as **Exhibit B**.

April 2022 in its same journal *Building and Environment*. The authors, led by Stephens, attempted to correct the test set-up flaws noted by GPS. Not surprisingly, the Second Study did **not** conclude that GPS's technology caused any increase in harmful compounds. In fact, the results of this study directly contradicted the results of the First Study. The Second Study again identified the device tested as belonging to GPS of "Charlotte, NC." Not surprisingly, Defendants have never provided open access to the Second Study. More significantly, the Second Study falsely claimed the results were "largely consistent" with the First Study, thus further causing harm to GPS.

26. The authors pursued the Second Study to correct the mistakes of the First Study, hoping to still show GPS's technology is unsafe. GPS's competitor, Zaatari, worked closely with Stephens and Zeng to direct the Second Study. The result of the Second Study only proved that the First Study was flawed and false. Nevertheless, the Second Study published by Elsevier attempted to disguise the inconsistencies and contradictions and claimed the study was "largely consistent" with their prior work—the First Study—which was false.

27. The Second Study contained three tests of VOCs. The Second Study concluded that the results of one test "suggest that there were minimal discernible impacts of ionizer operation on the sum of VOCs and aldehydes" but there were "mixed effects for individual VOCs." That same test showed that acetone concentrations *decreased* by 47% when using GPS's technology, whereas the First Study claimed GPS's technology led to an *increase* in acetone. The Second Study concluded that the results of a second VOC test suggested that "ionizer operation led to minimal quantifiable or discernible differences in VOCs and aldehydes overall." As for how the results of the first and second VOC tests compared, the Second Study acknowledged that "VOC results varied more than expected between the two tests." And the third VOC test showed that the concentration of all VOCs decreased when using GPS's technology with the exception of two:

toluene and isopropyl alcohol. The increase in toluene, however, was within propagated uncertainty. And the increase in isopropyl alcohol was not reliable—indeed, as the Second Study noted, "[r]esults for isopropyl alcohol in this test should also be interpreted with caution because there was an anomalously high outside chamber concentration measured when the ionizer was off." In short, the three tests showed no statistically significant increase in VOCs during ionizer operation.

28. Despite these three tests demonstrating no statistically significant increase in VOCs during ionizer operation, the Second Study doubled down on the conclusions of the First Study, misrepresenting that "the results remain largely consistent with our prior work testing the device" in which they concluded that the ionizer caused an increase in VOCs. In an effort to minimize the circulation of the Second Study, the authors and Elsevier chose not to provide open access, unlike the First Study.

29. Despite these results, Elsevier has still refused to retract the First Study, citing their "very strict" editorial policies. The Second Study exacerbated the harm to GPS because it claimed that it was "largely consistent" with the First Study, which is a false statement.

30. The damage to GPS caused by the First Study is irreparable and massive. Elsevier has refused to retract the First Study and doubled down on the harm by misrepresenting that the findings in the Second Study were largely consistent with the First Study.

31. The First Study has been relied upon by professionals consulting in the built environment in deciding not to purchase GPS's technology. It has also been used by GPS's competitors and media outlets to vilify GPS's technology to scare consumers away from using the technology.

32. Numerous of GPS's hardworking and honest employees in Charlotte, North Carolina have lost their jobs because of the First Study's severe impact on GPS's business. Defendants knew the impact on GPS in Charlotte, North Carolina would be severe.

33. GPS's employees have also been personally attacked in Charlotte, North Carolina and falsely accused of selling a product that harms people. Meanwhile, Elsevier profits on making these false claims without any accountability. This is not about honest scientific debate but rather about achieving a result at all costs cloaked under the brand of science. The conclusion reached in the First Study that GPS's device created harmful byproducts was a false statement of scientific fact intended to harm GPS.

34. Elsevier willingly or recklessly publishes bogus science in an all-out effort to dominate the publishing landscape and create an empire where profits trump scientific validity. In fact, Elsevier charges the authors to publish this bogus science directed at a company in Charlotte, North Carolina and/or charges members of the public, including those in Charlotte, North Carolina, to read this bogus science directed at a company in Charlotte, North Carolina.

35. Elsevier retains the absolute right to reject or require changes to any article that contains defamatory content or that may cause harm to another person or property.

36. Elsevier must be held accountable for publishing and disseminating flawed and false science and trampling over GPS and its hardworking employees.

37. While GPS respects academic investigation and scientific debate and in fact encourages independent scientific research into the safety and efficacy of air purification systems—including its own technology—GPS will not sit idly by while Elsevier spreads false, reckless, misleading, disparaging, and defamatory information about GPS and its products under

the guise of science. Elsevier has caused the broad dissemination of this unprotected speech and cannot use its sham peer-review and editorial processes as a shield.

38. GPS therefore brings this lawsuit to protect itself from Defendants' unlawful and reckless actions and to obtain relief for the irreparable harm Defendants have caused GPS and its business.

THE PARTIES

39. GPS is a corporation organized under the laws of the State of Delaware with a principal place of business at 3101 Yorkmont Road, Suite 400, Charlotte, North Carolina 28208.

40. Upon information and belief, Defendant Elsevier Inc. is a Delaware corporation with a principal place of business at 230 Park Avenue, Suite 800, New York, New York 10169 and may be served through its registered agent at 28 Liberty Street, New York, New York 10005.

41. Upon information and belief, Defendant Elsevier Ltd. is a United Kingdom corporation with a principal place of business at 125 London Wall, London EC2Y 5AS United Kingdom. Upon information and belief, Elsevier Ltd. may be served through its counsel at 125 London Wall, London EC2Y 5AS United Kingdom.

JURISDICTION AND VENUE

42. This is a civil action for defamation and unfair and deceptive trade practices under North Carolina law.

43. This Court has diversity jurisdiction over this lawsuit under 28 U.S.C. § 1332 because the matter in controversy exceeds $75,000, exclusive of costs and interests, and is between citizens of different states.

44. This Court has personal jurisdiction over both Elsevier entities because Elsevier has extensive contacts with North Carolina and in the context of the facts giving rise to this action, Elsevier directly targeted North Carolina in its actions and intent. Here, Elsevier has purposefully

and repeatedly directed activities at North Carolina. Specifically, Elsevier (1) made the decision to name GPS and its location in Charlotte, North Carolina in the First Study; (2) published the First Study that intentionally discussed and defamed GPS by name and identifies GPS as a Charlotte, North Carolina company; (3) published the Second Study that again specifically tested GPS's technology and identified GPS by name and its location in Charlotte, North Carolina; (4) manifested an intent to reach North Carolina readers when it published the First Study and Second Study, which discussed the safety and efficacy of a North Carolina product sold in North Carolina by a North Carolina company, on its website and in print in its allegedly peer-reviewed journal, *Building and Environment*, which were accessible in or mailed to North Carolina and for which North Carolina residents and educational institutions purchased the First Study and Second Study individually or through journal subscriptions; and (5) the entire impact and harm of the defamatory statements on GPS's reputation were felt in Charlotte, North Carolina. The First Study specifically stated that the device being tested and written about is a GPS device from "Charlotte, NC USA."[4]

45. Moreover, Elsevier is authorized to do business in North Carolina, maintains a registered agent in Raleigh, North Carolina, and sells books, journals, and more to North Carolina residents, both digitally and in print. For example, Elsevier has a contract with Duke University's libraries, Duke University and Western Carolina University pay for a subscription to Elsevier's ScienceDirect, an Elsevier website that hosts the electronic version of *Building and Environment*, the journal in which the First Study and Second Study were published, and Elsevier has published

[4] Ex. A.

numerous articles written by Duke University faculty.[5] [6] Accordingly, the First Study is accessible to university students and faculty in North Carolina for their consumption in North Carolina, at a minimum through the universities' subscriptions to ScienceDirect.

46. Venue is proper in this judicial district under 28 U.S.C. § 1391(b)(2) and (b)(3) because a substantial part of the events giving rise to the claims asserted in this action against Defendants occurred within this judicial district and Defendants are subject to personal jurisdiction in this judicial district.

FACTUAL BACKGROUND

A. GPS and GPS's Products

47. GPS is well-known in the air purification and quality industry for providing customers with accurate recommendations and products that meet each individual customer's air quality and purification needs.

48. GPS was founded in 2008 by Charlie Waddell and has a proven history of providing safe and effective products to its customers.

49. GPS's products are based on its revolutionary NPBI™ technology.

50. NPBI™ is a patented technology that cleans the air by introducing positive and negative ions in the space via the airflow in the ventilation system.

51. Charlie Waddell has obtained numerous patents related to GPS's technology.

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[5] Duke University, Scholars@Duke, https://scholars.duke.edu/display/publisherelsevier (last visited May 16, 2023); Lindsay McKenzie, Librarians prepare to take a harder line with publishers (2019), https://www.insidehighered.com/news/2019/03/27/librarians-prepare-take-harder-line-publishers (last visited May 16, 2023) (stating that in March 2019, Duke had signed a 3 year contract with Elsevier); Duke University, Library Guides, https://guides.library.duke.edu/az.php?q=sciencedirect (last visited May 16, 2023) (listing ScienceDirect as a database to which Duke students and faculty have access).

[6] Western Carolina University, Hunter Library Research Guides, https://researchguides.wcu.edu/az.php (last visited May 16, 2023).

52. It is well accepted scientifically that ionization helps clean the air and can help reduce certain airborne bacteria and viruses.

53. GPS's technology has served as an effective tool during the COVID-19 pandemic in reducing airborne indoor pathogens, including SARS-CoV-2.

54. GPS seeks to develop products that meet and exceed industry standards, as evidenced by the approvals of GPS's products, including the NPBI™ product, by independent certifying agencies such as Underwriters Laboratory (UL), Conformite Europeenne (CE), Radio Technical Commission for Aeronautics (RTCA), California's Office of Statewide Health Planning and Development (OSHPD), California Air Resources Board (CARB), and other standard-setting bodies. GPS's products also comply with all applicable Environmental Protection Agency regulatory requirements.

55. GPS's NPBI™ products have achieved the UL 2998 zero ozone emissions certification. This stringent certification requires that products demonstrate that they emit less than 0.005 parts per million (ppm) ozone, which is below the quantifiable level for ozone testing. Notably, certification under UL 2998 requires demonstration of ozone emissions at least ten times lower than what is permitted under the standard UL 867 test and by the United States Food and Drug Administration (FDA) for medical devices.

56. Consistent with GPS's commitment to transparency with its customers and potential customers, GPS prominently displays the results of tests by third-party labs of its NPBI™ technology on its website, including sensitivity testing, simulation testing, specialty testing, and field testing.[7]

[7] A true and correct copy of the third-party testing section of GPS's website is attached as **Exhibit D**.

57. GPS also works directly with customers—prior to any purchase—to conduct site-specific studies that assess the performance and appropriateness of GPS's products for their unique needs.

58. As a result of these efforts, along with the time and resources GPS invests in its products and GPS's consistent dedication to excellence, GPS has earned a reputation as a leader in the air quality/purification industry. Approximately 250,000 GPS NPBI™ air purification systems have been installed worldwide, including in federal government buildings, hospitals, corporate facilities, universities, and in hundreds of primary and secondary schools.

59. GPS's technology is also trusted by some of the world's leading companies involved in aviation manufacturing, aerospace technology, and performance equipment.

60. GPS has employees who are prominent members in good standing of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), and GPS's employees regularly lead lectures and speak at ASHRAE meetings.

61. GPS also has an active membership with the American Society for Health Care Engineering (ASHE), and its technology is incorporated into a system that has passed the stringent RTCA DO-160 tests.

62. GPS's products are routinely evaluated by leading experts, including those within the Environment, Health, and Safety (EHS) departments representing major institutions, such as the types of institutions identified above.

63. Independent, third-party testing has proven that GPS's technology does not produce any harmful VOCs. Boeing further stated in its test report that one of the benefits of GPS's technology was the lack of formation of harmful byproducts.

64. GPS's reputation for excellence and dedication to offering safe, high-quality products is embodied within its GPS Air logo, the GPS name, and its NPBI™ technology, all of which are readily associated with GPS and its products when encountered by the public and entities or individuals within the industry.

B. The Experiment Giving Rise to the First Study

65. In May 2020, Brent Stephens, an Environmental and Architectural Engineering professor and department chair at IIT approached a Ph.D. candidate in his department, Yicheng Zeng, to assist him in conducting a study to test a specific indoor air cleaner for efficacy and byproduct formation.[8] Prior to Stephens approaching Zeng in May 2020, she did not have any involvement in, knowledge of, or academic or other experience with ionization.[9] Nor was she aware of any concerns regarding bipolar ionization producing byproducts, despite reading articles and scientific studies concerning bipolar ionization.[10] Zeng testified in her deposition that she had reviewed all relevant literature on the topic and was not aware of any prior concerns that GPS's NPBI™ technology caused an increase in any harmful byproducts. There was no real scientific debate regarding GPS's technology. In fact, GPS had been selling its products since 2008 with no significant issues and no reports of anyone ever being harmed by GPS's technology.

66. Indeed, Stephens had a predetermined agenda when he proposed the study to Zeng and subsequently penned the First Study. As one example, in an email dated November 2, 2020, Zeng reported test results of the study to Stephens which showed agglomeration efficacy. Zeng stated in the email: *"Perhaps the ionizer charged a part of the particles at first, then the charged particles coagulate together into larger particles and settled faster."* Not happy with this

[8] **Exhibit C**, Zeng Dep. at 15:11–25. The deposition of Zeng was conducted by GPS in previous litigation on January 5, 2022.
[9] *Id*. at 16:10–14, 19:3–6.
[10] *Id*. at 48:24–49:14.

conclusion, Stephens responded trying to come up with any reason to ignore the results. He stated in response, *"So I would just suggest ignoring those bins."* Stephens later tried to justify not using recirculation for the test while knowing that recirculation was the proper set-up. Zeng eventually capitulated to Stephens' will and agreed to ignore certain test data, and in an email dated November 3, 2020, Stephens proclaimed, *"I think our story is strong now."*[11]

67. GPS's technology is regulated by the EPA and, prior to the First Study, there had been no credible claim or assertion that GPS's device harmed people.

68. Stephens is close friends with Zaatari, an individual who worked for one of GPS's biggest competitors, enVerid.

69. When the pandemic hit in early 2020, GPS's business skyrocketed due to the demand for its safe and effective technology. GPS's technology helped clean the air, including helping to reduce the airborne virus that causes COVID-19.

70. Unlike GPS's business, enVerid's business declined significantly in 2020. In late 2020, enVerid devised a plan to spread misinformation and false statements about GPS to steal GPS's customers and to save enVerid's failing business. Internal emails discovered from enVerid reveal that its CEO knew GPS's technology was in fact safe but wanted to create the false narrative that NPBI could harm people. Zaatari led this effort for enVerid and involved her close friend, Brent Stephens. enVerid and Zaatari called the plan to attack GPS as their "bipolar backlash" campaign.

71. Stephens saw an opportunity to help Zaatari and make a name for himself by trying to prove GPS's technology created harmful byproducts. Stephens became a key partner alongside

[11] *See* Ex. E at B. Stephens email chain dated Nov. 2–3, 2020.

Zaatari and enVerid in their pursuit of cultivating "bipolar backlash." Prior to this point, no credible scientist had claimed GPS's technology was harmful to anyone.

72. The First Study had three parts: (1) byproduct formation testing in the lab; (2) particle efficacy testing in the lab; and (3) byproduct formation testing in the field at a purported office located in Portland, Oregon. The setup for the byproduct and particle lab testing involved using a chamber inside a large lab at IIT where Zeng and Stephens study and work.[12] The lab in which the chamber was placed also contained "many, many [other] things," including lab "instruments," desks, chairs, and more.[13] The conditions of the lab in which the chamber was housed, including but not limited to an itemization of the contents of the room or a description of the HVAC system that supplied air to the room, were not described in the First Study, nor were they tested to achieve or determine any type of steady state condition with respect to VOC levels.[14] For the byproduct testing, the chamber was filled with objects and materials, including chairs, clothing, a desk, and a lamp, to produce VOCs inside the chamber.[15]

73. The GPS device utilized for the test was the GPS-FC48-AC. Stephens selected the device to be used in the First Study.[16] In emails obtained by GPS in other litigation, Stephens and the authors of the First Study debated whether to identify GPS by name and GPS's location in the study. In the emails, Stephens admitted that by doing so, it would cause GPS significant harm. Ultimately, Stephens and the authors decide to leave the decision to Elsevier, the publisher. Elsevier decided to identify GPS by name and also named the city, state and country of GPS's location ("Charlotte, NC USA"), although doing so had no independent scientific justification.

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[12] Ex. C at 51:16–53:8.
[13] *Id*. at 53:9–23.
[14] Ex. C at 72:21–74:11.
[15] *Id*. at 49:22–50:22.
[16] *Id*. at 47:5–16.

74. Neither the authors nor Elsevier consulted GPS regarding how to install the GPS device in the chamber.[17] The authors of the study attempted to measure chemical compounds being studied (also called analytes) present with ionization on and off, inside and outside the chamber. Importantly, throughout the testing period, air was escaping from inside the chamber to outside the chamber into the lab and vice versa; in other words, the chamber was not sealed.[18] Stephens acknowledged that the chamber was leaking such that "whatever happens inside [the chamber] is not only a function of ionizer operation but also what's happening outside the chamber." The chamber also did not recirculate the air, in direct contravention of the manufacturer guidance.

75. The First Study stated that the field test was performed in an office space in Portland, Oregon. This was false. Email correspondence shows that independent of the First Study, the Bend La Pine School District in Bend, Oregon paid Gall to conduct testing on GPS's NPBI™ technology at its schools. Gall performed that testing and he and Aurelie Laguerre ("Laguerre") prepared a written report for the school district dated September 10, 2020 summarizing the results. Following the testing and submission of their written report, Gall expressly stated in an email to Stephens that the payment he received from the Bend La Pine School District "was the first fee for service field work I've done, and so I also felt that I should give way on them dictating the testing they wanted, which created some less than ideal conditions IMO." Months later, Gall contacted the school district stating that he would like to include the testing data in a paper on the technology—what would be the First Study—and asked if the school district had any concerns with the study disclosing that the testing occurred in Bend, Oregon. The school district responded stating Gall could use the data but he should not reference the Bend La Pine School District in the

[17] *Id*. at 62:11–19.
[18] *Id*. at 59:5–24, 62:7–10.

study. The First Study falsely represents that the field testing occurred in an office in Portland, Oregon.

76. The field testing measured VOC concentrations upstream and downstream of a GPS device inside the air duct for the purported purpose of determining the ionizer's effect on VOC concentrations. But the First Study conceded that no control measurements—a key feature of the scientific method—were recorded because the individuals conducting the field testing had no access to the building controls. In other words, the field testing did not measure VOC concentrations with the ionizer off and did not account for the movement of people or objects inside the space. Even more problematic is that Zeng testified in her deposition that she had no knowledge of the field test and was not involved with the observations or with the accuracy of any of the field measurements reported in the First Study, despite being the lead author.

77. In the discussion of the field testing, the First Study admits that no conclusion could be drawn regarding the effect of GPS's technology on VOC concentrations due to these flaws. And in the written report prepared by Gall and Laguerre for the Bend La Pine School District, Gall and Laguerre likewise admit that the VOC levels may have resulted from occupants and objects in the space. Nevertheless, the First Study still relied on the field test to conclude that GPS's device "led to an increase" in certain VOCs. This was a false statement of scientific fact and was internally inconsistent with the field study section statement. Through the peer review and editorial processes, Elsevier knew that this was false or purposefully avoided its falsity and chose to publish the First Study anyway.

78. The participants in the study, who are named as authors of the First Study, include Zeng, Stephens, Prashik Manwatkar, Laguerre, Marina Beke, Insung Kang, Akram Ali, Delphine Farmer ("Farmer"), Gall, and Mohammad Heidarinejad.[19]

79. Stephens and Heidarinejad are both professors at IIT who share the lab in which the experiment was conducted.[20]

80. Zeng, Manwatkar, Beke, Kang, and Ali are all graduate students in Stephens' lab who were studying under Stephens at IIT.[21]

81. Gall is a professor at Portland State University who is an outspoken critic of GPS. Laguerre is Gall's graduate student who assisted Gall with the field testing and subsequent report for the Bend La Pine School District.[22]

82. Farmer is an assistant professor at Colorado State University who likewise has a vendetta against GPS.

83. Together, Gall and Farmer are part of Zaatari's echo-chamber comprised of a small group of individuals who have published similarly problematic critiques of GPS and cite to each other as sources, creating an endless circle in which they can perpetuate their defamatory remarks with cover from others with a parallel agenda. Notably, Stephens, Gall, and Farmer all signed on to Zaatari's Open Letter within a month after the First Study was published, and all have written articles, published tweets, and given interviews defaming GPS. Notably, prior to the flawed study at issue here, there was no research or other studies that suggested UL 2998 certified needlepoint bipolar ionization produced harmful levels of byproducts. Zaatari's Open Letter relied exclusively

[19] Ex. A at 1.
[20] Ex. C at 20:17–21:15.
[21] *Id*. at 23:12–25, 27:20–29:18.
[22] Ex. C at 26:2–25.

on the First Study to falsely state that GPS's technology created harmful byproducts. The Open Letter was sent directly to GPS's customers.

84. Zaatari and her agents relied upon the First Study in making these false and defamatory attacks against GPS.

85. Stephens' contribution to the "bipolar backlash" campaign was further motivated by Zaatari's spearheading of raising funds for Zeng and Stephens to conduct additional studies related to GPS's NPBI™ technology. And the evidence demonstrates that Zaatari's involvement with Stephens' subsequent studies went beyond just raising funds.

86. For example, in an email dated April 19, 2021 (around the same time as the Open Letter), Zaatari reacted to a test matrix sent to her by Stephens and Zeng. She responded by coaching them on how to test a specific GPS device and stated, "The output of this work will help inform schools [sic] decision."[23] Zaatari was working for enVerid to steal GPS's school district customers when she wrote this email.

87. In addition, in an effort to promote "bipolar backlash," Zaatari and Stephens often tweeted and retweeted each other's posts that condemn the use of ionization products. Likewise, Zaatari and Stephens jumped at every opportunity to publicly comment to the media and other outlets regarding GPS's NPBI™ technology, or similar ionization technology.

C. The First Study Is False.

88. The First Study falsely concluded that GPS's technology caused an increase in certain harmful byproducts. The First Study was based on a flawed design, suppressed data, relied upon distorted and undisclosed data, and misrepresented study results to make it appear that certain byproducts increased.

[23] *See* **Exhibit F**.

i. The First Study Ignored and Suppressed Contradictory Results

89. The purpose of the First Study was to conduct experiments to "evaluate the gas and particle removal effectiveness and potential for byproduct formation resulting from the operation of" a GPS device.[24] The authors selected nine analytes to measure inside and outside of the chamber and measured the concentration with the ionizer on and off; the authors also used two test methods (TO-11A and TO-15), as represented in Table 2 of the First Study, to measure certain analytes. The First Study employed a flawed ratio calculation comparing the conditions inside the chamber with those outside of the chamber to assess whether an analyte increased in concentration, purportedly because of the ionizer.[25] The First Study reported an increase in the following analytes during ionizer operation: formaldehyde, acetaldehyde, acetone, butyraldehyde, ethanol, and toluene. Based on the data reported, the First Study made the following critical conclusion*: bipolar ionization led to "observed increases in some oxygenated VOCs" and specifically highlighted acetone, ethanol, and toluene*. This conclusion was the lethal blow to GPS's business.

90. The First Study's conclusion that operation of the ionizer led to increases in certain VOCs inside the chamber was false. As the authors expressly recognized in email correspondence, the chamber was not perfectly sealed and, therefore, one could not conclude that any change in VOC concentrations inside the chamber was because of the ionizer or because of changes in the air outside the chamber.

91. In addition, the First Study's conclusion that the ionizer led to an increase in certain VOCs was false and misleading because it ignored contradictory data and discarded and suppressed relevant analyte measurements. Defendants were aware of this misconduct or purposely avoided it.

[24] Ex. A at 2.
[25] Ex. A at 8, Table 2 n.1.

92. To begin, for acetone, although the study conducted two detection methods (TO-11A and TO-15), it reported only one (test method TO-15) in the main body of the First Study that purported to show a 73% increase in acetone using the flawed ratio calculation. But the supplementary data to the First Study listed in Appendix 1 contained the other test data (TO-11A), which showed a ***decrease of acetone*** with ionization on (when applying the First Study's ratio method), directly contradicting what was reported in the main body of the First Study. Specifically, Zeng admitted in her deposition that analyte measurements reported in the main body of the First Study were ***incorrect when compared to appendices*** contained in the supplemental information.[26] Appendices 1 and 2 contained in the First Study's supplementary data purported to show the complete analyte concentration measurements reported from the lab chamber tests. When compared to the measurements selectively published in Table 2 in the main body of the First Study, the results are the exact opposite:

Table 2
Organic compound analysis for the TO-15 and TO-11A analyte lists applied to samples collected inside (I) and outside (O) the chamber during ionizer on and off conditions on October 15, 2020.

Test Method	Analyte	MW (g/mol)	Ionizer Off			Ionizer On			% Change in I/O Ratio[1]
			Inside (µg/m³)	Outside (µg/m³)	I/O Ratio	Inside (µg/m³)	Outside (µg/m³)	I/O Ratio	
TO-11A	Formaldehyde	30	11.4	5.9	1.95	10.6	5.3	1.98	+2%
TO-11A	Acetaldehyde	44	5.9	5.4	1.10	5.7	4.6	1.25	+13%
TO-15	Acetone	58	23	36	0.64	41	37	1.11	+73%
TO-11A	Butyraldehyde	72	2.1	2.0	1.06	2.2	1.6	1.38	+28%
TO-15	Toluene	92	2.6	4.5	0.58	3.4	5.1	0.67	+15%
TO-15	1,2-Dichloroethane	99	4.1	<2.4	>1.7	<2.4	<2.4	n/a	At least −42%
TO-15	Ethylbenzene	106	7.5	<2.7	>2.8	<2.7	<2.7	n/a	At least −64%
TO-15	m,p-Xylene	106	24	<5.2	>4.6	<5.2	<5.2	n/a	At least −78%
TO-15	Dichlorodifluoromethane	121	3.6	<3.0	>1.2	<3.0	<3.0	n/a	At least −17%
Total	Summed TOC[2]	n/a	84.2	58.9	1.43	68.0	58.8	1.16	−19%

Appendix 1: List of TO-15 VOC analytes and reported concentrations from chamber tests[27]

Test Method	Analyte	Units	Ionizer On		Ionizer Off	
			Inside	Outside	Inside	Outside
TO-15	1,1,1-Trichloroethane	mg/m³	< 0.0033	< 0.0033	< 0.0033	< 0.0033
TO-15	1,1,2-Trichloroethane	mg/m³	< 0.0033	< 0.0033	< 0.0033	< 0.0033

[26] Ex. C at 106:8–22.
[27] GPS incorporates the table and appendix labeling set forth in the First Study and its supplemental data for the convenience of the Court and identification purposes only. GPS does not admit any allegation made in, or inferences suggested by, such labeling and instead denies them.

TO-15	1,1-Dichloroethane	mg/m³	< 0.0024	< 0.0024	< 0.0024	< 0.0024
TO-15	1,1-Dichloroethene	mg/m³	< 0.0024	< 0.0024	< 0.0024	< 0.0024
TO-15	1,2,4-Trichlorobenzene	mg/m³	< 0.0046	< 0.0046	< 0.0045	< 0.0045
TO-15	1,2-Dibromoethane	mg/m³	< 0.0046	< 0.0046	< 0.0045	< 0.0045
TO-15	1,2-Dichlorobenzene	mg/m³	< 0.0036	< 0.0037	< 0.0036	< 0.0036
TO-15	1,2-Dichloroethane	mg/m³	0.0041	< 0.0024	< 0.0024	< 0.0024
TO-15	1,2-Dichloropropane	mg/m³	< 0.0027	< 0.0027	< 0.0027	< 0.0027
TO-15	1,4-Dichlorobenzene	mg/m³	< 0.0036	< 0.0037	< 0.0036	< 0.0036
TO-15	1,4-Dioxane	mg/m³	< 0.0055	< 0.0055	< 0.0054	< 0.0055
TO-15	2-Butanone	mg/m³	< 0.0046	< 0.0046	< 0.0045	< 0.0045
TO-15	Acetone	mg/m³	0.023	0.036	0.041	0.037
TO-15	Benzene	mg/m³	< 0.0018	< 0.0018	< 0.0018	< 0.0018
TO-15	Bromodichloromethane	mg/m³	< 0.0039	< 0.0040	< 0.0039	< 0.0039
TO-15	Bromoform	mg/m³	< 0.016	< 0.016	< 0.016	< 0.016
TO-15	Bromomethane	mg/m³	< 0.0058	< 0.0058	< 0.0057	< 0.0058
TO-15	Carbon disulfide	mg/m³	< 0.0019	< 0.0019	< 0.0019	< 0.0019
TO-15	Carbon tetrachloride	mg/m³	< 0.0039	< 0.0040	< 0.0039	< 0.0039
TO-15	Chlorobenzene	mg/m³	< 0.0027	< 0.0027	< 0.0027	< 0.0027
TO-15	Chloroform	mg/m³	< 0.0030	< 0.0030	< 0.0030	< 0.0030
TO-15	cis-1,2-Dichloroethene	mg/m³	< 0.0024	< 0.0024	< 0.0024	< 0.0024
TO-15	cis-1,3-Dichloropropene	mg/m³	< 0.0027	< 0.0027	< 0.0027	< 0.0027
TO-15	Dibromochloromethane	mg/m³	< 0.0052	< 0.0052	< 0.0051	< 0.0052
TO-15	Dichlorodifluoromethane	mg/m³	0.0036	< 0.0030	< 0.0030	< 0.0030
TO-15	Ethylbenzene	mg/m³	0.0075	< 0.0027	< 0.0027	< 0.0027
TO-15	m,p-Xylene	mg/m³	0.024	< 0.0052	< 0.0051	< 0.0052
TO-15	Methyl tert-butyl ether	mg/m³	< 0.0021	< 0.0021	< 0.0021	< 0.0021
TO-15	Methylene chloride	mg/m³	< 0.021	< 0.021	< 0.021	< 0.021
TO-15	Naphthalene	mg/m³	< 0.0030	< 0.0030	< 0.0030	< 0.0030
TO-15	o-Xylene	mg/m³	< 0.0027	< 0.0027	< 0.0027	< 0.0027
TO-15	Styrene	mg/m³	< 0.0027	< 0.0027	< 0.0027	< 0.0027
TO-15	Tetrachloroethene	mg/m³	< 0.0042	< 0.0043	< 0.0042	< 0.0042
TO-15	Toluene	mg/m³	0.0026	0.0045	0.0034	0.0051
TO-15	trans-1,2-Dichloroethene	mg/m³	< 0.0024	< 0.0024	< 0.0024	< 0.0024
TO-15	trans-1,3-Dichloropropene	mg/m³	< 0.0027	< 0.0027	< 0.0027	< 0.0027
TO-15	Trichloroethene	mg/m³	< 0.0033	< 0.0033	< 0.0033	< 0.0033
TO-15	Trichlorofluoromethane	mg/m³	< 0.0033	< 0.0033	< 0.0033	< 0.0033
TO-15	Vinyl acetate	mg/m³	< 0.021	< 0.021	< 0.021	< 0.021
TO-15	Vinyl chloride	mg/m³	< 0.0015	< 0.0015	< 0.0015	< 0.0015
TO-15	Xylenes, Total	mg/m³	0.025	< 0.0079	< 0.0079	< 0.0079

Appendix 2: List of TO-11A VOC analytes and reported concentrations from chamber tests

Test Method	Analyte	Units	Ionizer On		Ionizer Off	
			Inside	Outside	Inside	Outside
TO-11A	2,5-Dimethylbenzaldehyde	µg/m³	< RL[1]	< RL	< RL	< RL
TO-11A	Acetaldehyde	µg/m³	5.9	5.4	5.7	4.6
TO-11A	Acetone	µg/m³	29.6	23.0	26.0	19.4
TO-11A	Acrolein	µg/m³	< RL	< RL	< RL	< RL
TO-11A	Benzaldehyde	µg/m³	< RL	< RL	< RL	< RL

TO-11A	Butyraldehyde	µg/m^3	2.1	2.0	2.2	1.6
TO-11A	Crotonaldehyde	µg/m^3	< RL	< RL	< RL	< RL
TO-11A	Formaldehyde	µg/m^3	11.4	5.9	10.6	5.3
TO-11A	Hexaldehyde	µg/m^3	< RL	< RL	< RL	< RL
TO-11A	Isovaleraldehyde	µg/m^3	< RL	< RL	< RL	< RL
TO-11A	m,p-Tolualdehyde	µg/m^3	< RL	< RL	< RL	< RL
TO-11A	o-Tolualdehyde	µg/m^3	< RL	< RL	< RL	< RL
TO-11A	Propionaldehyde	µg/m^3	< RL	< RL	< RL	< RL
TO-11A	Valeraldehyde	µg/m^3	< RL	< RL	< RL	< RL

93. Incredibly, this conflicting result was not reported in the First Study. It was intentionally suppressed and ignored. Zeng, the lead author of the First Study, testified that she thought there was a mislabeling issue with the data in the Appendix and that it reported "ionizer on" when it should have said "ionizer off." Even assuming *arguendo* Zeng was correct, that data would still show only a 4.7% increase of acetone (using the First Study's flawed ratio method) instead of the 73% increase reported in the First Study. A 4.7% increase would have been statistically insignificant and likely caused by natural fluctuation with objects in the chamber, as admitted by Stephens and Gall in emails, and would have demonstrated no increase of acetone. Zeng confirmed this calculation in her deposition. If the First Study's flawed ratio method is disregarded, the actual concentration of acetone ***decreases*** using the TO-11A result. Through its peer review and editorial processes, Elsevier had knowledge of or purposely avoided this conflicting data but nonetheless published the First Study.

94. In an email dated October 30, 2020, Stephens admitted the formaldehyde data did not support a conclusion that ionization had increased that analyte: "*So the formaldehyde data show basically no change. I/O ratio of 1.95 ionizer off; 1.98 ionizer on. +2% higher,* ***but not enough to demonstrate real formation*** *(could be higher because of slightly higher inside chamber temperatures leading to slightly higher emissions inside for example).*"[28] Despite first

[28] *See* B. Stephens email dated Oct. 30, 2020, attached hereto as **Exhibit E**.

acknowledging that the study's formaldehyde data exhibited "basically no change" and that GPS technology does not "demonstrate real formation" of formaldehyde, the First Study falsely published a 2% increase in formaldehyde production, without clarifying the statistical insignificance of this increase in the conclusion. Elsevier's peer review and editorial processes should have detected and corrected this omission.

95. Evidence further revealed that Stephens knowingly disregarded and suppressed data concerning another analyte, acetaldehyde. In an email dated October 30, 2020, Stephens noted that the TO-15 method showed a reduction in acetaldehyde. Stephens went back to the commercial lab and asked for results using the TO-11A method, which purportedly showed an increase in acetaldehyde. Like the acetone data that was selectively ignored in the First Study, so too was the conflicting acetaldehyde data. But this time, the conflicting data was left out of the supplemental data and the main text of the First Study entirely. The suppression of data was intended to achieve the desired end result, i.e. the conclusion that GPS's technology caused an increase in VOCs, and under Elsevier's own definition constituted falsification and fabrication of results. Through its peer review and editorial processes, Elsevier knew there were multiple test results which yielded different results and showed no increase in byproducts but published the First Study omitting these contradictory results.

96. Ignoring and suppressing data and results was not part of a legitimate scientific debate or pursuant to an acceptable test method but was rather in furtherance of the scheme to develop a false and fabricated story.

97. In February 2022, well after this lawsuit was filed and a year after Elsevier published the First Study, Elsevier published a "Corrigendum" to the First Study in which it attempted to justify or correct two of the errors pointed out by GPS. First, the Corrigendum

claimed the headings in the appendices were "accidentally transposed" and that the "mislabeling does not affect any other figures, tables or results." However, despite repeated requests from GPS, Elsevier and the authors have refused to disclose the First Study's underlying notes and raw data.

98. Elsevier on its own website defines "falsification" as "changing data measurements to conveniently fit the desired result or excluding inconvenient results with the same end result. Fabrication is inventing results." Elsevier nonetheless published the First Study that excluded inconvenient results and invented the desired end result.

99. In its Corrigendum, Elsevier attempted to justify the suppression of the data by claiming the TO-11A data was not as accurate as the TO-15 data. The Corrigendum claimed, "the reason that this study analyzed the acetone concentration data from the TO-15 analyte list rather than the TO-11A list is that TO-15 is a more precise and accurate method for the compound with the instruments used." This claim is in fact false and contrary to well accepted scientific testing methods. The Corrigendum made no mention of the missing acetaldehyde test and did not provide any raw data or notes from the First Study.

100. Elsevier only published this self-serving Corrigendum after being sued by GPS and well after GPS's business had been damaged irreparably.

ii. The First Study was Fundamentally Flawed

101. The scientific method requires that experiments have controls, be replicated, and be reproducible by others in their results. The study here lacked all three.

102. ***First***, fundamental to a reliable scientific experiment is a counterfactual control. Zeng admitted that there was no experimental control to test ionizer on and off conditions or to control who entered the room while measurements were being taken, thereby altering the indoor

air composition outside the chamber, and skewing the data.[29] This is particularly significant here, since the authors chose to measure their results in terms of a ratio of inside chamber to outside chamber air composition. Accordingly, if conditions were altered outside the chamber (for instance, if someone opened the door and altered the air composition in the room by letting air in or out of the room), the results would be impacted. And, in fact, this is a proven flaw of the study. For example, Elsevier and the authors chose to disregard the results from one of the test methods for the compound acetone (the TO-11A method) in favor of the other test method (TO-15) because of purported variation in the concentration of acetone outside of the chamber. Notwithstanding that this explanation was not included anywhere in the First Study, the rationale for disregarding this data directly conflicted with the inclusion of similar data for another compound, ethanol. Ethanol, as reported in Table 3 of the First Study, showed a 48% variation outside the chamber with ionization on (compared to the 16% difference reported for the TO-11A acetone results) and yet, the First Study used the ethanol test result to support the conclusion notwithstanding this variation.

103. The ethanol concentration inside the chamber actually declined, but Elsevier nevertheless published a 78% increase for ethanol based on the flawed ratio calculation where ethanol dropped dramatically outside the chamber. Elsevier further noted in the First Study that there was a "high uncertainty" of identifying ethanol at all. Nevertheless, the First Study emphasized the ethanol result to suggest GPS's technology increased the compound, while selectively ignoring the contradictory acetone result. This lack of control combined with the dubious ratio calculation created an environment in which the authors could manipulate and

[29] Ex. C at 78:9–19.

cherry-pick their results. Elsevier was put on notice of these errors and flaws on the face of the study through its peer review and editorial processes.

104. ***Second***, the First Study did not repeat or replicate any of the experiments in the study, despite that experimental replication is an essential step of the scientific process and routine to scientific studies to ensure that data, analysis, and results are reliable. Indeed, the underlying study performed each of the two test methods only once for each of the VOCs and particulate matter and did so on one day. Zeng also admitted that no replicates were performed to ensure that the results (even if accurately reported) could be repeated by others.[30]

105. ***Third***, the authors failed to install and utilize the GPS device in the manner recommended by the manufacturer, thereby tainting all their results, making it virtually impossible for others to reproduce or assess the data in any meaningful way or use it as a model for real-life conditions. The First Study's execution further erred in that the testing environment for the study never reached a steady state, or a scenario in which the levels of air contaminants in the chamber reached equilibrium. This lack of achieving a steady state also makes it impossible for the study to be reproduced by others. Instead, the First Study states that the study was merely "approaching steady-state baseline conditions inside the chamber."[31] "***Approaching*** steady-state" means that the study never achieved steady state. In noting that they were approaching a steady state, the authors tacitly admit that they should have achieved a steady state in the testing environment prior to commencing the study, yet they did not.

iii. Elsevier's Peer Review and Editorial Processes

[30] Ex. C at 140:8–24.
[31] *E.g.*, Ex. A at 4.

106. Each of these three shortcomings were made known to Elsevier during its peer review and editorial processes. Experimental controls, replication, and reproducibility by others are all fundamental scientific principles that are integral to the scientific method. Elsevier's failure to address even the most elementary flaw with the scientific method demonstrates that its peer review and editorial processes are little more than a rubber stamp without any teeth.

107. After payment by the authors to Elsevier, Defendants published the First Study in the scientific journal *Building and Environment* under an open access format with willful or reckless disregard for its false conclusions, blatant biases of its authors, its violations of scientific integrity, and distortions of data.

108. The publication of the First Study flies in the face of Elsevier's own peer review protocols, which acknowledge that "[t]he peer review system exists to validate academic work, helps to improve the quality of published research, and increases networking possibilities within research communities… Elsevier relies on the peer review process to uphold the quality and validity of individual articles and the journals that publish them."[32]

109. Elsevier has described its editorial process to GPS as "very strict."

110. Elsevier touts its peer review process on its website to lend credibility to its articles and to increase sales.

111. Elsevier articulates and promotes several peer review processes in detail, including single anonymized review, double anonymized review, triple anonymized review and open review, all of which employ and emphasize the need to: (1) limit bias; (2) encourage honest, open reviewing; and (3) promote review comments and criticism.[33] Notably, Elsevier cites to a 2015

[32] *See supra* n. 2.
[33] *Id.*

survey by the Publishing Research Consortium, where 82% of researchers agreed that "without peer review there is no control in scientific communication." Yet, none of the objective errors and omissions in the First Study were corrected during Elsevier's peer review protocol or prior to the First Study's publication.

112. The First Study lacked the transparency outlined in the peer review procedure that Elsevier claims is integral to its publication process.[34] The acknowledgements of the First Study note that "*several colleagues who will remain anonymous who provided their insight on experiences with installations of the tested ionizer and also loaned equipment for our testing*."[35] When pressed on the identity of these individuals in her deposition, Zeng's attorney instructed Zeng not to answer, although she did testify that the identity of anyone who contributed to the First Study should be disclosed for peer review and that here, they were not.[36]

113. Accordingly, Elsevier's peer review of the First Study, which failed to address or correct any of the issues outlined in this First Amended Complaint, was flawed and reckless. Elsevier knew of the data distortions and process flaws but ignored these issues and published the study anyway.

114. In 2022, Elsevier had almost $3 billion in revenue with $1.2 billion in profits. It has created a publishing empire designed to place profits over scientific integrity. Elsevier specifically reaps large profits in the United States and from North Carolina, but at the same time claims it cannot be held accountable in U.S. courts for its misconduct.

115. In support of its "profits over ethics" agenda, Elsevier willingly and knowingly published the false and flawed First Study attacking GPS by name and identifying its location in

[34] *See id*. ("In general transparency is the key to trust in peer review.").
[35] Ex. A at 13.
[36] Ex. C. at 42:13–44:21.

Charlotte, North Carolina. In fact, Elsevier accepted $4,080 from the authors to publish the First Study through its open access program—meaning the First Study was free to the public and could be as widely disseminated as possible. Elsevier also published the First Study in the *Building and Environment* journal, which it disseminated throughout the United States, including to North Carolina.

116. By falsely concluding that GPS's NPBI™ technology led to an increase in harmful byproducts based on a flawed, biased, and scientifically unreliable study, the First Study defamed GPS and its world-renowned technology.

D. The First Amendment Does Not Protect Defendants' Conduct

117. Defendants are unable to seek shelter under the First Amendment for their false and misleading statements against GPS. Although protective of speech rights, the Constitution does not provide carte blanche to publishers like Defendants, who are responsible for the content of the materials that they disseminate, to recklessly publish false statements that disparage businesses without regard for the truth or falsity of their statements.

118. Calculated and reckless falsehoods, such as the statements published by Defendants in the First Study, which specifically names GPS and its technology, fall far outside the ambit of First Amendment protection.

119. The purpose of the First Study was not to address an ongoing scientific debate or address an issue of public concern but rather was focused solely on a "commercially available" product. The First Study ignored an acetone test result, suppressed a contrary acetaldehyde test result, and relied upon a faulty test chamber to achieve the desired conclusion. Moreover, the field test section in the First Study was misleading and internally inconsistent with the First Study's conclusion related to VOCs. Defendants cannot claim these falsehoods and flaws would be equally known by the readers of the journal. First, at least one critical data point was excluded from the

First Study entirely. Second, other contradictory data was suppressed or distorted in the First Study. Additionally, as will be discussed in more detail below, the intended audience for *Building and Environment* does not have the chemistry background necessary to identify any of the fatal flaws in the study itself or to critically assess the resulting conclusions. The First Study's initial abstract statement contained the false and damaging conclusion.

120. While a hallmark of the First Amendment is free speech and academic freedom—propositions that GPS stands for and encourages—First Amendment protection does not extend to knowing or reckless false statements, including those made under the guise of academia and a peer-reviewed publication. Indeed, the data proffered in the First Study is not unbiased scientific debate or scholarly discourse, but rather, an erroneous, reckless, and misleading presentation of deliberately false information with the intent to harm GPS specifically. The First Amendment does not protect such speech.

E. The Intended Audience and Purpose of *Building and Environment*

121. On its website, Elsevier describes the intended audience for its journal *Building and Environment* to include the following: "civil engineers, environmentalists, planners, architects and designers." The audience for *Building and Environment* relies upon the journal in making critical decisions about what technologies to employ within the built environment. These decision-makers include engineers, architects, planners and designers who consult with the owners and occupants of buildings and other structures.

122. One of the "scope" areas for the journal listed on its website includes "air quality and airborne infection control in building science and engineering."

123. The journal is not intended to reach chemists, academics, lab technicians or other scientists who would be able to critically analyze the technical differences in measuring analytes and the relevant test methods of using TO-15 versus TO-11A. For example, a civil engineer,

planner or architect would normally not appreciate or even understand these technical scientific topics or be able to critically assess the data points of such tests.

124. The intended audience would also not appreciate the importance of the supplemental data in the First Study's appendices. Defendants intentionally did not provide the content of the appendices in the text of the published First Article, but rather provided a link. Elsevier exclusively controlled the format and presentation of the First Study. Moreover, the critical false conclusion appeared in the abstract of the First Study, and many of the readers of the First Study likely did not review the technical data or the appendices.

125. The First Study reached the critically false conclusion that GPS's technology led to an increase in certain harmful VOCs based on excluding contradictory VOC measurement results and employing a fabricated ratio calculation to disguise the influence of outdoor air inside the test chamber. The audience for *Building and Environment* would likely not have the training and experience to be able to critically assess these distortions and fabrications in the study. Moreover, the contradictory acetaldehyde result was excluded from the First Study entirely. Elsevier knew of these fabrications or purposely avoided them through its peer review and editorial processes.

F. The Harm To GPS

126. The false, misleading, and defamatory statements written and published by Defendants in the First Study have caused, and continue to cause, GPS substantial harm.

127. The First Study is the only study ever published claiming that GPS's NPBI™ technology causes an increase in certain harmful VOCs. By making this false statement of scientific fact and publishing the First Study in the primary journal relied upon by GPS's customers, Defendants provided the ammunition to virtually destroy GPS's business.

128. GPS had been existence since 2008 and sold its technology all over the world with thousands of satisfied customers. Its technology has been installed by NASA, the Mayo Clinic,

Boston's Children's Hospital, Google and other highly regarded and sophisticated institutions and companies. GPS's founder, Charlie Waddell, has obtained numerous patents and created an ionization technology that does not produce ozone or other harmful byproducts.

129. It is well known and scientifically accepted that ionization helps reduce certain airborne viruses and pathogens.

130. In 2020 and 2021, it was further proven through reliable third-party testing that GPS's technology also helped reduce the airborne virus that causes COVID-19.

131. GPS's business increased rapidly through 2020. By the beginning of 2021, GPS's business was valued at approximately $1.97 billion (EBITDA of $197 million times a multiple of 10). This valuation was a conservative estimate of the value of the business.

132. After Defendants published and disseminated the First Study, the demand for GPS's technology declined rapidly. Numerous customers and manufacturer representatives cited the First Study in questioning the continued use of GPS's technology. Some buildings turned off GPS's devices that had been previously installed for fear of being harmed by VOCs. For example, the Newark School District in California turned off the GPS devices due to the fear spread by the First Study. Newark ultimately tested the GPS devices and found that there were no harmful byproducts being produced.

133. Numerous national media outlets cited to the Defendants' First Study in claiming that GPS's technology was harmful based on the false conclusion reached in the First Study that GPS's technology led to an increase in harmful VOCs.

134. GPS's business plummeted with its value declining below $250 million.

135. All of the hard work spent building GPS's business and reputation vanished overnight with the publication of Defendants' First Study.

136. As a result, GPS was forced to make the difficult decision to lay off numerous employees due to the sharply declining business. While Elsevier enjoyed record profits of over $1 billion in 2022, GPS was forced to cut its workforce in half. Many of its employees suffered direct personal attacks in which they were ridiculed or criticized for working for GPS.

137. The GPS employees who lost their jobs worked at GPS's offices in Charlotte, North Carolina. They also lived in or near Charlotte where many were raising their families.

138. GPS and its employees and investors achieved the incredible valuation of $1.97 billion due to the ingenuity and hard work of the men and women who worked there. Like many American inventors before him, Charlie Waddell lived the dream of making a technology better and helping people clean indoor air around the world. Conversely, Elsevier has made billions of dollars ruthlessly publishing articles without taking responsibility for their content.

139. GPS has been harmed by the value of its business declining by more than $1.7 billion. In addition, GPS has lost profits of approximately $180 million. GPS has further incurred substantial attorneys' fees and expenses trying to mitigate the harm caused by the First Study. GPS's total damages caused by the Defendants' misconduct exceeds $1.8 billion.

140. Moreover, despite the glaring flaws set forth in the First Study, it has been the basis for a number of unsupported claims pertaining to GPS and its NPBI™ technology made by Zaatari, Gall, Farmer, enVerid, and others.

141. The First Study has been cited consistently by Zaatari and her agents to fuel her biased and meritless campaign to induce a "bipolar backlash."

142. In email exchanges obtained by GPS via subpoenas, the authors knew they would be sued because the First Study was flawed and false. They stated in these emails that they wanted the study published because Elsevier would be the main defendant and would shield them. In an

email in December 2020, Brent Stephens wrote, "Publishing…would mean that we then have a publisher behind us, and the publisher actually has insurance for getting sued for defamation, libel, slander, etc. The journal would be the named party in the suit and we would be the et. al."

143. The authors of the First Study hoped that the Elsevier goliath would defeat any claim that their study was flawed and false. Instead of acting like true scientists and attempting to replicate the study or truthfully consider all of the data, the authors of the study manipulated the results with Elsevier's help in an effort to gain fame and profits.

G. Elsevier's Second Study Reaffirmed the Defamatory Statements in the First Study

144. After this lawsuit was filed, a small subset of the original authors published the Second Study with Elsevier which attempted to correct the flaws and errors of the First Study. Stephens and two of the original authors from the First Study embarked on the Second Study for the purpose of trying to correct the flaws of the First Study and hoping to create the same false results. Zaatari organized the fundraising for the Second Study and directed Stephens and Zeng on how to conduct the Second Study. Zaatari was working for GPS's competitor, enVerid, and had been tasked by enVerid with creating "bipolar backlash" to destroy GPS's business.

145. Not surprisingly, the results of the Second Study totally contradicted the results of the First Study but instead of the authors and Elsevier doing the right thing and retracting the First Study, they remained silent and misrepresented the results were inconclusive. They also buried the Second Study by not providing open access, unlike the First Study.

146. The authors could have tried to replicate the First Study per normal scientific method but instead revamped the test knowing they had to fix the flaws after GPS called them out. Defendants also were aware prior to publication of the Second Study that the First Study was false and flawed.

147. GPS sent retraction demands and sued Defendants prior to publication of the Second Study.

148. The Second Study actually showed acetone concentrations going down by 43%, whereas in the First Study the authors claimed GPS's technology led to an increase in acetone. The authors claimed to have conducted "replicates" which showed variations of VOC concentrations. Despite this inconsistency, the authors of the Second Study doubled down on the first study stating, "the results remain largely consistent with our prior work testing the device."

149. The Second Study also misrepresented that the authors had no known competing financial interests or "personal relationships that could have appeared to influence the work reported in this paper." This statement was false, and Defendants knew it. Stephens and Zeng had direct communications with Zaatari on how to conduct the Second Study and were provided the funds from Zaatari's efforts. Zaatari worked for and represented the interests of GPS's competitor. Defendants were on notice of Stephens' connections with Zaatari.

150. Despite all of these flaws and misrepresentations, Defendants published the Second Study in April 2022. Defendants again made the decision to specifically name GPS and its location in Charlotte, North Carolina. However, this time, Defendants did not provide open access for the Second Study. Instead, Defendants charged consumers, including consumers in North Carolina, to access the Second Study.

151. By claiming the Second Study was largely consistent with the First Study and failing to disclose the manipulation and involvement of GPS's competitor, Defendants further compounded the harm to GPS in an effort to harm GPS's business in Charlotte, North Carolina.

CAUSES OF ACTION

Count I: Defamation

152. GPS incorporates the preceding paragraphs of the Complaint by reference as if fully set forth herein.

153. Defendants have intentionally published false statements to the public at large through publishing the First Study in the publicly available and allegedly peer-reviewed journal *Building and Environment* to actual and prospective customers of GPS, and to members of the industry directly and indirectly by virtue of, among others, the numerous inaccurate, misleading, disparaging, and defamatory statements described and identified in the paragraphs above. Each of these statements are unambiguously defamatory based on the context.

154. The false statements published by Defendants refer to GPS and specifically purport to convey untrue facts about GPS and/or GPS's NPBI™ air purification system.

155. These false statements expressly or impliedly asserted facts that are objectively verifiable, such as Defendants' inaccurate, misleading, disparaging, and defamatory statements about the characteristics, efficacy, safety, and quality of GPS's products. For example, the First Study reported an increase in four analytes (formaldehyde, acetaldehyde, butyraldehyde, and toluene) and concluded that GPS's NPBI™ air purification system led to "observed increases in some oxygenated VOCs."[37] But this statement was not supported by the data. Appendices 1 and 2 contained in the First Study's supplementary data purport to show the complete analyte concentration measurements reported from the lab chamber tests. When compared to the measurements selectively published in Tables 1 and 2 in the First Study, the results are the exact opposite.

[37] Ex. A at 8; *see also id.* at Abstract.

156. Defendants' written statements are also libel per se as defined by North Carolina state law. Defendants' numerous statements impeach GPS in its profession by maligning GPS's honesty, integrity, virtue, and reputation by either directly stating or indirectly implying that GPS's products and technology are not only inadequate for their intended purpose, but also pose safety risks to the public. These statements are reasonably calculated to produce such results and imply that GPS knowingly or intentionally disregards the safety and well-being of its customers and the public at large in developing, promoting, and selling its products.

157. Defendants' written and published statements are therefore defamatory per se under North Carolina common law because they have injured GPS in its occupation and business. Among other things, Defendants have made inaccurate, misleading, disparaging, and defamatory statements to the public, including GPS's customers and prospective customers, regarding the characteristics, efficacy, safety, and quality of GPS's products and technology.

158. Upon information and belief, Defendants wrote and published these statements with actual malice. Defendants knew or reasonably should have known that the statements in question were false. Defendants are aware that omitting certain facts from its statements could leave a reader, including but not limited to GPS's current and prospective customers, with a substantially false impression and, in fact, Stephens wrote the statements with the intent to leave those impressions on the reader. Upon information and belief, Defendants purposefully avoid the truth by refusing to consult sources that can objectively verify the truth (or falsity) of its statements. At the very least, Defendants are negligent in determining whether its statements are true.

159. Defendants' false statements are defamatory per se, entitling GPS to a presumption of general damages. Additionally, Defendants' false statements directly and proximately injured GPS, and will continue to do so. As a result, GPS has suffered and will continue to suffer general

damages, including injury to its character, reputation within the industry, and the goodwill it has developed over many years.

160. Defendants' false statements directly and proximately injured GPS, and will continue to do so, resulting in special damages, including loss of earning capacity and loss of past and future income. GPS satisfied its obligations under N.C. Gen. Stat. § 99-1(a) and provided notice to Defendants of the Article's false and defamatory nature.[38] GPS is therefore entitled to specific, punitive, and other damages to which GPS may be entitled.

Count II: Unfair and Deceptive Trade Practices

161. GPS incorporates the preceding paragraphs of the Complaint by reference as if fully set forth herein.

162. As described above, Defendants have published false and disparaging written statements about GPS's products, including the NPBI™ air purification system, thereby impacting its business and constituting libel per se. Defendants' statements were and continue to be disparaging because they cast doubt on the characteristics, efficacy, safety, and quality of GPS's products, including the NPBI™ air purification system. Defendants accomplish this by making claims and purported assessments about GPS and GPS's products, often false even though they are disguised as an unbiased study and assessment of GPS's products. Defendants' statements impeach GPS in its trade or business because the statements go to the heart of GPS's character as a business, its trustworthiness, and the quality of its products, and therefore constitute an unfair or deceptive act affecting commerce.

[38] *See generally*, Ex. B at 8 (copying Elsevier representative).

163. Defendants' statements were directed to, among others, GPS's customers, prospective customers, and individuals and businesses throughout the industry and therefore were intended to and did affect commerce.

164. The context of these statements demonstrates that Defendants intended to cast doubt on the characteristics, efficacy, safety, and quality of GPS's products. These statements demonstrate an intent to paint GPS as a producer of dangerous and unhealthy products and a company with whom its existing and prospective retailers and customers should sever ties.

165. Defendants' false and misleading statements have caused, and will continue to cause, the loss of goodwill and the loss of current and prospective customers who, but for Defendants' actions, would continue to do business with GPS. These direct pecuniary losses are attributable to Defendants' false communications because, on information and belief, those false statements have played a substantial part in causing irreparable harm to GPS's reputation in the industry.

166. Furthermore, when GPS identified the multiple, serious issues with the First Study, Defendants published the Second Study and misrepresented that its results were "largely consistent" with the First Study. Defendants' bad faith, campaign against GPS continues to this day as it refuses to retract either the First Study or the Second Study.

167. Because Defendants have committed unfair and deceptive trade practices as outlined above, GPS is entitled to treble damages. *See* N.C. Gen. Stat. § 75-16.

JURY DEMAND

GPS hereby demands a trial by jury on all claims and issues so triable.

PRAYER FOR RELIEF

GPS respectfully requests that the Court enter judgment in its favor and against Defendants as follows:

A. an award of GPS's damages, including its lost profits;

B. an award in an amount that will enable GPS to engage in corrective advertising at a level that will effectively counter Defendants' unlawful activity;

C. an award of GPS's reasonable attorneys' fees and the costs of this action;

D. exemplary damages in a sum to be determined by the trier of fact;

E. treble damages pursuant to N.C. Gen. Stat. § 75-16;

F. pre- and post-judgment interest as allowed by law;

G. an order requiring Defendants to retract their false statements and engage in corrective advertising; and

H. such other and further relief to which GPS may be entitled.

Dated: June 5, 2023

Respectfully submitted,

MCGUIREWOODS LLP

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CERTIFICATE OF SERVICE

I hereby certify that on this **5th day of June, 2023**, the foregoing **FIRST AMENDED COMPLAINT** was filed electronically with the Clerk of Court for the Western District of North Carolina by using the CM/ECF system. Counsel for all parties in this case are registered CM/ECF users and will be served by the CM/ECF system.

/s/ Robert A. Muckenfuss
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